

Harnessing the Risk-Related Data Supply Chain: An Information Architecture Approach to Enriching Human System Research and Operations Knowledge

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NASA's Human Research Program (HRP) and Space Life Sciences Directorate (SLSD), not unlike many NASA organizations today, struggle with the inherent inefficiencies caused by dependencies on heterogeneous data systems and silos of data and information spread across decentralized discipline domains. The capture of operational and research-based data/information (both in-flight and ground-based) in disparate IT systems impedes the extent to which that data/information can be efficiently and securely shared, analyzed, and enriched into knowledge that directly and more rapidly supports HRP's research-focused human system risk mitigation efforts and SLSD's operationally oriented risk management efforts. As a result, an integrated effort is underway to more fully understand and document how specific sets of risk-related data/information are generated and used and in what IT systems that data/information currently resides. By mapping the risk-related data flow from raw data to useable information and knowledge (think of it as the data supply chain), HRP and SLSD are building an information architecture plan to leverage their existing, shared IT infrastructure. In addition, it is important to create a centralized structured tool to represent risks including attributes such as likelihood, consequence, contributing factors, and the evidence supporting the information in all these fields. Representing the risks in this way enables reasoning about the risks, e.g. revisiting a risk assessment when a mitigation strategy is unavailable, updating a risk assessment when new information becomes available, etc. Such a system also provides a concise way to communicate the risks both within the organization as well as with collaborators. Understanding and, hence, harnessing the human system risk-related data supply chain enhances both organizations' abilities to securely collect, integrate, and share data assets that improve human system research and operations.